



SIMATIC ET 200SP HA, analog input module, safety-oriented, F-AI 8xI 2-wire/4-wire HART HA, 16-bit, 2-wire/4-wire, SIL3 (IEC 61508), up to PL e (ISO 13849-1), suitable for terminal block H1, F1, color code CC00, channel diagnostics

General information	
Product type designation	F-AI 8xI 2-/4-wire HART HA
Firmware version	V1.0
• FW update possible	Yes
Color code for module-specific color identification plate	CC00
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 configurable/integrated from version	V5.6 SP2 (with S7 F Systems V6.4)
• PCS 7 configurable/integrated from version	V9.0 SP3 + UC04 (with F Systems V6.4)
• PROFINET from GSD version/GSD revision	GSDML V2.42 2023.01
Redundancy	
• Redundancy capability	Yes; with TB type F1
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption (rated value)	90 mA; without sensor supply
Encoder supply	
Number of outputs	8
Short-circuit protection	Yes
24 V encoder supply	
• 24 V	Yes
• Short-circuit protection	Yes
• Output current per channel, max.	30 mA
Power	
Power consumption from the backplane bus	90 mW
Power loss	
Power loss, typ.	2.8 W
Address area	
Address space per module	
• Inputs	22 byte
• Outputs	5 byte
Analog inputs	

Number of analog inputs	
• For current measurement	8
permissible input current for current input (destruction limit), max.	35 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	150 Ω
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	150 Ω
HART communication	
• Primary Master	Yes
• Secondary Master	No
• input resistance (with HART communication)	150 Ω; for operation with an external secondary master (e.g. communicator), an external load may be necessary to achieve a total impedance of 230 - 600 Ω.
Cable length	
• shielded, max.	1 000 m; shielded, twisted pair
Analog value generation for the inputs	
Measurement principle	Sigma Delta
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	20 ms (at 50 Hz); 16.66 ms (at 60 Hz)
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
Smoothing of measured values	
• parameterizable	Yes; in 4 stages (1, 4, 16, 64 conversion cycles), channel-by-channel
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Crosstalk between the inputs, min.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %
safety-relevant accuracy	
• up to 40 °C, max.	0.6 %; (0.7% in vertical installation)
• up to 70 °C, max.	0.9 %
note regarding accuracy	the safety-relevant accuracy consists of a basic error, a temperature-dependent drift, aging and internal safety measures
Influence of a HART signal modulated on the input signal in relation to input range	
• error at 16.6 ms integration time	0.11 %
• error at 20 ms integration time	0.11 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode voltage, max.	35 V
• Common mode interference, min.	80 dB
Protocols	
HART protocol	Yes
• Protocol version	up to Revision 7
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Overflow/underflow	Yes
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED

- Monitoring of the supply voltage (PWR-LED) - Channel status display - for channel diagnostics - for module diagnostics	Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED		
Potential separation			
Potential separation channels			
between the channels	No		
between the channels and backplane bus	Yes		
Between the channels and load voltage L+	No		
Permissible potential difference			
between the inputs (UCM)	30 V DC / 25 V AC		
Isolation			
tested with			
between backplane bus and load voltage	1 500 V DC (load voltage L+ and channels I+n bridged)		
between the backplane bus and functional ground (FE)	1 500 V DC		
between load voltage and functional ground (FE)	1 500 V DC (load voltage L+ and channels I+n bridged)		
between the channels and load voltage	370 V AC		
between the potential groups of the channels	370 V AC		
Standards, approvals, certificates			
Highest safety class achievable in safety mode			
Performance level according to ISO 13849-1	PLd (PLe for 1oo2 voting on the F-CPU)		
Category according to ISO 13849-1	cat. 3 (cat. 4 for 1oo2 voting on the F-CPU)		
SIL acc. to IEC 61508	SIL 3		
Probability of failure (for service life of 20 years and repair time of 100 hours)			
— Low demand mode: PFDavg in accordance with SIL3	< 27E-05 (< 9E-05 for 1oo2 voting on the F-CPU)		
— High demand/continuous mode: PFH in accordance with SIL3	< 4E-09 1/h (< 1E-09 1/h for 1oo2 voting on the F-CPU)		
Ambient conditions			
Ambient temperature during operation			
horizontal installation, min.	-40 °C		
horizontal installation, max.	70 °C		
vertical installation, min.	-40 °C		
vertical installation, max.	60 °C		
Dimensions			
Width	22.5 mm		
Height	115 mm		
Depth	138 mm		
Weights			
Weight, approx.	220 g		
Classifications			
		Version	Classification
	eClass	14	27-24-26-01
	eClass	12	27-24-26-01
	eClass	9.1	27-24-26-01
	eClass	9	27-24-26-01
	eClass	8	27-24-26-01
	eClass	7.1	27-24-26-01
	eClass	6	27-24-26-01
	ETIM	10	EC001596
	ETIM	9	EC001596
	ETIM	8	EC001596
	ETIM	7	EC001596
	IDEA	4	3562
	UNSPSC	15	32-15-17-05
Approvals / Certificates			

General Product Approval



[KC](#)



For use in hazardous locations

[Declaration of Conformity](#)



[Miscellaneous](#)

Functional Safety

[TUEV](#)

[Type Examination Certificate](#)

[TUEV](#)

Maritime application



Maritime application



[NK / Nippon Kaiji Kyokai](#)



[CCS \(China Classification Society\)](#)

Environment

Siemens EcoTech



Industrial Communication

[PROFIsafe](#)

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